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Class:

Why Do We Sleep?

By Trudee Romanek 2021

In this informational text, Trudee Romanek explains what scientists know about sleep. As you read, take notes on what happens in your body while you sleep.

Humans spend about one third of their lives asleep. By the time you're 15, you will have slept for 5 years! But why do we do it?

[1] Sleep has puzzled people for a long time. Why do we lie down and zone out for hours every night? Isn't sleep just a giant waste of time? Could we learn to do without it?

Now scientists are beginning to answer some of those questions. They've discovered that brains and bodies don't just shut down at night. Quite the contrary!¹ At night, your body repairs itself and grows strong. Your brain is busy making memories and learning. Sleep is so useful that all animals do it. And without it, waking life would be impossible.



<u>"Sleeping child"</u> by Annie Spratt is in the public domain.

All Through the Night

What happens when you go to sleep each night? The sun goes down. You take a bath and read a book. Your eyelids start to droop. Time for bed!

After lying down, most people take about 20 minutes to fall asleep.

- [5] In the twilight zone between asleep and awake, your brain begins to drift. It muffles signals from the muscle and senses, ignoring information from the outside world. That can give you the odd sensation² of falling. You aren't really—you're just falling asleep.
 - 1. Contrary (adjective) totally different; opposite
 - 2. Sensation (noun) a feeling with no cause



What makes you fall asleep? The first trigger³ is your body clock, an internal⁴ time-keeper. At around the same time every day, this clock releases a special "night" signal chemical. This tells the whole body to slow down and get ready for sleep.

That heavy feeling that you really need to close your eyes is triggered by a build-up of old nerve messenger chemicals. These are made as you think and move during the day. When the clutter⁵ gets too much, the brain senses that it's time for a tidy-up. Time to sleep! While you're asleep, your body will break down the old message stuff and clear it away, ready for a new day.

As you slip into sleep, your heart slows down and you breathe more slowly. Your eyes shut, and your brain ignores ordinary sounds. That's why when you're sound asleep, you don't hear small noises or other things that might wake you up. The part of the brain that keeps you aware of time passing also switches off, so in the morning it feels like the night takes no time at all.

But your brain does not shut down at night. In fact, it gets quite active. It's got important jobs to do.

Sleep, Dream, Repeat

[10] You might think sleep is just...sleep. But in fact, you do several different kinds of sleeping, cycling⁶ through them several times through the night.

First is a light sleep. After about half an hour, your brain sinks into a deep sleep. During deep sleep, long, slow waves of electrical impulses⁷ move through the brain. These slow waves move all the important things you learned and did today from short-term memory into long-term memory. At the same time, you forget unimportant details like putting on your socks. That frees up space to learn new things tomorrow.

After about 20 minutes or so of slow-wave sleep, your sleeping brain shifts gears. It starts to look more awake—though it isn't. In the next stage of sleep, your muscles go completely slack.⁸ Your body doesn't move at all. But your eyes dart back and forth behind closed eyelids. This motion gives this kind of sleep its name — REM, for "rapid eye movement."

During REM sleep, the brain is making connections. It links new experiences to old memories. It also bundles together actions you've been practicing, such as the motions of riding a bike, into a

- 3. **Trigger** (noun) an event or action that causes another action to take place
- 4. located on the inside of a body
- 5. Clutter (noun) a messy or overly crowded bunch of things
- 6. Cycle (verb) a circle of events that repeats in a regular pattern
- 7. in the nervous system, when energy is carried between neurons
- 8. Slack (adjective) not tight



new, single muscle memory: ride bike. All this connecting triggers dreams—which can get pretty weird.

You cycle through stages of light, deep, and REM sleep every 90 minutes, over and over, all night long. At the beginning of the night, you do more slow-wave sleeping, while the brain cleans house. Toward morning, you get more REM sleep, as it builds new knowledge. That's when the most vivid⁹ dreams happen.

Dream Yourself Smart

[15] Why do we dream? Scientists aren't completely sure, but they have some ideas.

Dreams might be a side-effect of memory making. While you sleep, your brain sorts through everything that happened during the day. It tries to link new experiences to old memories that are similar in some way. As it connects things, the "story-making" part of your brain turns them into a story, and you get a dream.

Dreams may also help regulate¹⁰ emotions.¹¹ At night, the brain can replay upsetting events in a safe dream space, with less intense¹² emotions. This can help make the memory less painful.

When it's sorting through the day's memories, your brain pays special attention to anything that made you feel extra happy or scared or excited. In dreams, the brain can try out solutions to problems that are bothering you. Finding even a weird dream solution can make you feel more in control the next day.

Dreams can even help you learn. In one test, volunteers¹³ learned how to play a new game. That night, some of them were awakened whenever they entered REM sleep. The others were awakened the same number of times, but only during non-REM sleep. The next day, the people who got their REM sleep did much better at the game. The players who started out being worst at the game had the most dreams about it — and they improved the most.

- [20] So if you want to do well on that test, don't stay up all night studying. Instead, get a good night's sleep. That's when your brain learns best.
 - 9. Vivid (adjective) calling up clear images
 - 10. to control so that a standard is kept
 - 11. Emotion (noun) a strong feeling such as joy, hatred, or love
 - 12. Intense (adjective) strong, as feelings or emotions
 - 13. a person who offers to work or help without pay



The Night Gym

Your brain gets a good workout at night — but your body is not idle, either. Sleep is your body's time to repair and grow.

At night, your body releases chemicals that help create new bits of skin, muscle, and other parts of you. Sleep is also when your body makes the hormones¹⁴ that help you grow. So, even though you may not do much running while you're asleep, your muscles are busy growing stronger.

Your immune system¹⁵ gets super busy at night, clearing away germs and making more germfighting antibodies.¹⁶ People who don't sleep enough get sick more often and take longer to get well. That's also why you often feel extra sleepy when you're ill. Your body needs more sleep to fight germs and get well.

Sleep On It

Scientists still have many questions about sleep. They'd like to know why some people need more sleep than others, and how some animals get by with a lot less sleep. They'd like to find ways to help people sleep better.

[25] But they know one thing for sure: getting enough sleep is the most important thing you can do to stay healthy and smart.

Think of sleep like a free magic potion that arrives every night. It makes you strong, helps you grow, and fights germs! It makes you smarter, happier, and more creative! To get some, just lie down.

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- 14. A substance made by certain cells in the body that help control body processes like growth.
- 15. The body's system of organs, tissues, and cells, that protects the body by discovering and killing disease-causing germs in the body.
- 16. A part in a person's blood that kills germs in order to keep them healthy.



Text-Dependent Questions

Directions: For the following questions, choose the best answer or respond in complete sentences.

- 1. What is the main idea of the text?
 - A. All humans need the same amount of sleep.
 - B. No one knows why sleep is important for us.
 - C. REM sleep is the most important part of sleep.
 - D. Scientists are studying the many benefits of sleep.
- 2. What is the author's main purpose in this text?
 - A. to explain how sleep helps us stay healthy
 - B. to share the steps to take to fall asleep easily
 - C. to compare how animals sleep to how humans sleep
 - D. to help us understand why people have trouble sleeping
- 3. Which statement best describes the relationship between sleep and learning?
 - A. It is easier to remember things that you learn when you are asleep because your brain is not busy.
 - B. When you sleep, your brain enters REM sleep, which makes you forget things that were unimportant.
 - C. It is harder to learn things when you sleep for a long time because your brain erases these memories.
 - D. When you sleep, your brain has time to dream, which makes you understand what you have learned better.
- 4. As it is used in paragraph 9, the word "active" helps the reader understand that at night
 - A. your brain turns off.
 - B. your brain is still busy.
 - C. your body stays awake.
 - D. your body does nothing.



5. What is the connection between sleep and a healthy body?



Discussion Questions

Directions: Brainstorm your answers to the following questions in the space provided. Be prepared to share your original ideas in a class discussion.

1. The author describes how dreams help us. Do you remember your dreams? Think back to a dream you remember well. Can you connect what happened in your dream to feelings or experiences that may have happened that day?

2. When you have a big event coming up, like an important game or test, how do you prepare the night before? What would the author's advice be about how to prepare for a big event? Do you agree with his advice? Why or why not?

3. The author explains how sleep keeps us healthy. What are some other ways that you stay healthy?